

1	PROCESSING ARCHITECTURE	40	...External sync or interrupt signal
2	.Vector processor		
3	..Scalar/vector processor interface	41	..RISC
		42	..Operation
4	..Distributing of vector data to vector registers	43	...Mode switching
5	...Masking to control an access to data in vector register	200	ARCHITECTURE BASED INSTRUCTION PROCESSING
6	..Controlling access to external vector data	201	.Data flow based system
7	..Vector processor operation	202	.Stack based computer
8	...Sequential	203	.Multiprocessor instruction
9	...Concurrent	204	INSTRUCTION ALIGNMENT
10	.Array processor	205	INSTRUCTION FETCHING
11	..Array processor element interconnection	206	.Of multiple instructions simultaneously
		207	.Prefetching
12	...Cube or hypercube	208	INSTRUCTION DECODING (E.G., BY MICROINSTRUCTION, START ADDRESS GENERATOR, HARDWIRED)
13	...Partitioning		
14	...Processing element memory	209	.Decoding instruction to accommodate plural instruction interpretations (e.g., different dialects, languages, emulation, etc.)
15	...Reconfiguring		
16	..Array processor operation		
17	...Application specific		
18	...Data flow array processor	210	.Decoding instruction to accommodate variable length instruction or operand
19	...Systolic array processor		
20	...Multimode (e.g., MIMD to SIMD, etc.)	211	.Decoding instruction to generate an address of a microroutine
21	...Multiple instruction, Multiple data (MIMD)	212	.Decoding by plural parallel decoders
22	...Single instruction, multiple data (SIMD)	213	.Predecoding of instruction component
23	.Superscalar	214	INSTRUCTION ISSUING
24	Long instruction word	215	.Simultaneous issuance of multiple instructions
25	.Data driven or demand driven processor	216	DYNAMIC INSTRUCTION DEPENDENCY CHECKING, MONITORING OR CONFLICT RESOLUTION
26	..Detection/pairing based on destination, ID tag, or data		
27	..Particular data driven memory structure	217	.Scoreboarding, reservation station, or aliasing
28	.Distributed processing system	218	.Commitment control or register bypass
29	..Interface	219	.Reducing an impact of a stall or pipeline bubble
30	..Operation	220	PROCESSING CONTROL
31	...Master/slave	221	.Arithmetic operation instruction processing
32	.Microprocessor or multichip or multimodule processor having sequential program control	222	..Floating point or vector
33	..Having multiple internal buses	223	.Logic operation instruction processing
34	..Including coprocessor	224	..Masking
35	...Digital Signal processor	225	.Processing control for data transfer
36	.Application specific		
37	..Programmable (e.g., EPROM)		
38	..Offchip interface		
39	...Externally controlled internal mode switching via pin		

CLASS 712 ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS:
 PROCESSING ARCHITECTURES AND INSTRUCTION PROCESSING (E.G., PROCES-
 SORS)

- 226 .Instruction modification based
on condition
- 227 .Specialized instruction
processing in support of
testing, debugging, emulation
- 228 .Context preserving (e.g.,
context swapping,
checkpointing, register
windowing
- 229 .Mode switch or change
- 230 .Generating next microinstruction
address
- 231 .Detecting end or completion of
microprogram
- 232 .Hardwired controller
- 233 .Branching (e.g., delayed branch,
loop control, branch predict,
interrupt)
- 234 ..Conditional branching
- 235 ...Simultaneous parallel fetching
or executing of both branch
and fall-through path
- 236 ...Evaluation of multiple
conditions or multiway
branching
- 237 ...Prefetching a branch target
(i.e., look ahead)
- 238Branch target buffer
- 239 ...Branch prediction
- 240History table
- 241 ..Loop execution
- 242 ..To macro-instruction routine
- 243 ..To microinstruction subroutine
- 244 ..Exception processing (e.g.,
interrupts and traps)
- 245 .Processing sequence control
(i.e., microsequencing)
- 246 ..Plural microsequencers (e.g.,
dual microsequencers)
- 247 ..Multilevel microcontroller
(e.g., dual-level control
store)
- 248 ..Writable/changeable control
store architecture
- 300 BYTE-WORD REARRANGING, BIT-FIELD
INSERTION OR EXTRACTION,
STRING LENGTH DETECTING, OR
SEQUENCE DETECTING

FOREIGN ART COLLECTIONS

FOR 000 CLASS-RELATED FOREIGN DOCUMENTS

December 2002

418	COMPUTER GRAPHICS PROCESSING	611	..Anti-aliasing or image smoothing
419	..Three-dimension	612	...Save attributes for each object affecting a given pixel
420	..Solid modelling	613	...Subpixel processing
421	..Hidden line/surface determining	614	...Pixel fragment
422	...Z buffer (depth buffer)	615	...Convolving technique
423	..Tessellation	616	...Error diffusion
424	..Voxel	617	..Contrast
426	..Lighting/shading	618	..Image with abnormal condition
427	..Space transformation	619	..Graphic manipulation (object processing or display attributes)
428	..Adjusting level of detail	620	..Clipping
581	..Attributes (surface detail or characteristic, display attributes)	621	...Based on model of objects
582	..Texture	622	....Testing or using bounding shape (e.g., bounding box sphere)
583	...Solid Texture	623	....Object clipped to view volume
584	...Bump map	624	....Object clipped to another object
585	...Non-planar surface	625	...Based on image data
586	...Mathematically defined	626	....Masking
587	...MIP map	627	....Non-rectangular array
588	...Repeating pattern	628	....Rectangular region
589	..Color or intensity	629	..Merge or overlay
590	...Gamut clipping or adjustment	630	...Combining model representations
591	...Color processing in perceptual color space	631	...Reducing redundancy
592	...Transparency (mixing color values)	632	...Placing generated data in real scene
593	...Color selection	633	....Augmented reality (real-time)
594	....Using GUI	634	...Image based
595	...Expert system or AI	635	....Non-overlapping
596	..Dither or halftone	636	....Character and graphics
597	....Color	637	....Priority based
598	....Spatial	638	....Insertion of bitmapped moving picture
599	....Spatial	639	...Weighted
600	...Color bit data modification or conversion	640	....Weights vary across image (e.g., transition from foreground to background)
601	....Using look up table	641	...Fixed overlay pattern
602	....Plural look up tables	642	..Picking
603	...Format change (e.g., NTSC to RGB, RGB to composite, XYZ to RGB)	643	..Arithmetic processing of image data
604	...Color space transformation (e.g., RGB to YUV)	644	...Matrix calculations
605	...Change in number of bits for a designated color (e.g., 4 bits to 8 bits, 8 bits to 4 bits)	645	...Hierarchy of transformations (e.g., hierarchy of global and local coordinate)
606	..Interpolation of attribute values across object surface	646	..Morphing
607	...In perspective	647	..Distortion
608	...Tri-linear	648	..Affine
609	...Bi-linear		
610	...Linear		

CLASS 345 COMPUTER GRAPHICS PROCESSING, OPERATOR INTERFACE PROCESSING, AND SELECTIVE VISUAL DISPLAY SYSTEMS

649	..Rotation	689	..Textual entry or display of manipulation information (e.g., enter or display degree of rotation)
650	...Graphical user interface tools	440	.Graph generating
651	...Alignment functions (e.g., snapping, gravity)	440.1	..Real-time waveform display
652	...Constrained manipulations (e.g., movement in less than all dimensions)	440.2	..Bar graph
653	....3D manipulations	441	.Shape generating
654	....2D manipulations	442	..Curve
655	...Object based	443	..Straight line
656	...Image based (addressing)	467	.Character generating
657	....By arbitrary angle	468	..Character geometry processing
658	....By 90 degrees increment	469	...Character generation using control points or hints
659	...Image rotates in response to display device orientation	469.1	..Character border
660	..Scaling	470	..Generating character fill data from outline data
661	...Graphical user interface tools	471	..Alteration of stored font
662	...Alignment functions (e.g., snapping, gravity)	472	...Scaling
663	...Constrained manipulations (i.e., movement in less than all dimensions)	472.1	....Reduction only
664	....3D manipulations	472.2	....Enlargement only
665	....2D manipulations	472.3	..Calligraphic
666	...Object based	473	.Animation
667	...Image based (addressing)	474	..Motion planning or control
668	....By arbitrary ratio	475	..Temporal interpolation or processing
669	....By integer multiples	700	OPERATOR-INTERFACE (E.G., GRAPHICAL USER INTERFACE)
670	....Reduction only	701	.Force feedback interaction
671	....Enlargement only	702	.Tactile based interaction
672	..Translation	703	.Cultural based (including language, time, monetary units displayed)
673	...Averaging technique	704	.Playback of recorded user events (e.g., script or macro playback)
674	...Copying data to create additional rows or columns	705	.Help presentation
676	...Graphical user interface tools	706	..Virtual character or avatar (e.g., animated person)
677	...Alignment functions (e.g., snapping, gravity)	707	..Adaptive to user skill level
678	...Constrained manipulations (i.e., movement in less than all dimensions)	708	..Context sensitive
679	....3D manipulations	709	...Coaching (e.g., animated examples, or handholding or show me execution)
680	....2D manipulations	710	...Input alert
681	...Object based	711	...Tool tip (e.g., cursor position based)
682	...Image based (addressing)	712	...Topic roadmap or index
683	....Sprite	713	...Hierarchical
684	....Scrolling	714	..Combining diverse help information (e.g., different sources)
685	....Alphanumeric	715	..Balloon or bubble appearance
686	....Memory addressing		
687	.....Smooth or continuous		
688	....Attribute changes during scrolling		

716	.On screen video or audio system interface	748	.User interactive multicomputer data transfer (e.g., file transfer)
717	..Multiple diverse systems		
718	...Mode switching interface (e.g., switching between TV and computer)	749	..Downloading remote executables (e.g., Java, CGI)
719	..Video interface	750	.Multiple users on a single workstation
720	...Video traversal control	751	.Computer supported collaborative work between plural users
721	...Indexed control		
722	...Video parameter control	752	..Interactive email
723	..For video segment editing or sequencing	753	..Computer conferencing
724	...Cut and paste operation	754	...Multicursor (e.g., multiple on-screen pointers)
725	...Trimming	755	...Floor Control
726	...Effects or transitions interface	756	...Real Time Video
727	.Audio user interface	757	...Virtual 3D environment
728	..Audio input for on-screen manipulation (e.g., voice controlled GUI)	758	...Chat room
729	..For a visually challenged user	759	..Group window
730	.Presentation to audience interface (e.g., slide show)	760	.Mark up language interface (e.g., HTML)
731	..Authoring tool	761	.Plural adjacent interactive display devices
732	..Slide manipulating or editing	762	.User interface development (e.g., GUI builder)
733	.For plural users or sites (e.g., network)	763	..Graphical or iconic based (e.g., visual program)
734	..Interactive network representation of devices (e.g., topology of workstations)	764	.On-screen workspace or object
735	...Configuration	765	..Customizing multiple diverse workspace objects
736	...Network managing or monitoring status	766	..Z order of multiple diverse workspace objects
737	...User navigation between devices	767	..Focus control of multiple diverse workspace objects
738	..Network resource browsing or navigating	768	..Translucency or transparency interface element (e.g., invisible control)
739	...Selecting from a resource list (e.g., address book)	769	..Data transfer operation between objects (e.g., drag and drop)
740	..Remote operation of computing device	770	...Cut and paste
741	..Access control or permission	771	..Instrumentation and component modeling (e.g., interactive control panel, virtual device)
742	...Interactive portal (e.g., secure point of access)	772	...Progress or activity indicator
743	...Access rights to interactive controls	773	...Virtual input device (e.g., virtual keyboard)
744	..Interface customization or adaption (e.g., client server)	774	..Ticker metaphor
745	...Based on stored usage or user profile (e.g., frequency of use, cookies)	775	..Office layout metaphor (e.g., filing cabinet, desk)
746	...Interface conversion	776	..Indexed book or notebook metaphor
747	...End user based (e.g., preference setting)	777	..Tab metaphor (e.g., property sheet)
		778	..Multiple virtual screen or desktop switching

779	..Task bar or desktop control panel	814	...Limited time selection opportunity
780	..Entry field (e.g., text entry field)	815	...Sizing modification (e.g., scaling)
781	..Window or viewpoint	816	...Partial input lookup (e.g., partial string lookup)
782	...3D Perspective view of window layout	817	...Context location indication (e.g., previous or next menu item indication)
783	...On-screen window list or index	818	...Simultaneous next and previous indication (e.g., menu road map)
784	...Window scrolling	819	...Next menu indication
785	....Autoscroll	820	...Previous menu indication
786	....Scroll tool (e.g., scroll bar)	821	...Emphasis
787	.....With content attributes on scroll tool	822	...Preselection emphasis
788	...Layout modification (e.g., move or resize)	823	...Selection or confirmation emphasis
789	....Based on usage or user profile (e.g., frequency of use)	824	...Unavailable emphasis
790	....Overlap control	825	...Dynamically generated menu items
791	.....Always on top	826	...Add on item (e.g., software developed, customized)
792	.....Tiling or split pane	827	...Mnemonic (e.g., accelerator key)
793	.....Cascading	828	...Partial menu display (e.g., one menu item at a time)
794	.....Priority or overlap change (e.g., z-order)	829	...Advancing to next menu item in the same menu
795	.....Minimizing or send to bottom	830	....Scrolling (e.g., spin dial)
796	.....Bring to top	831	...With specific input device
797	.....Viewing lower priority windows (e.g., overlapped windows)	832	...Analog selection style
798	...Combining moving and resizing operations (e.g., moving causes resizing)	833	...Slider control
799	...Moving (e.g., translating)	834	...Radial based (e.g., radial or pie menu)
800	...Resizing (e.g., scaling)	835	...Selectable iconic array
801	....Contained object scale change	836	....3D icons
802	...Focus control	837	....Compound or aggregate icon
803	...Window differentiation	838	....Thumbnail or scaled image
804	...Interwindow link or communication	839	....Imitating real life object
805	....On-screen link or communication (e.g., cue)	840	...Using button array
806	...Window memory structure	841	...Sub-menu structure
807	...Stored priority attribute	842	....Tear off
808	..Pop-up control	843	...Pull down
809	..Dialog box	844	...Timed
810	..Menu or selectable iconic array (e.g., palette)	845	...Multiple selections in a single menu
811	...Based on usage or user profile (e.g., frequency of use)	846	..Non-array icons
812	...Preselection (e.g., best guess before mouse click)	847	...Shortcut
813	....Default selection item	848	..Interface represented by 3D space
		849	...Individual object
		850	...Navigation within 3D space
		851	....On-screen navigation control

852	...Picking 3D objects	177	..Including surface acoustic detection
853	..Hierarchy or network structure		
854	...Navigation within structure	178	..With alignment or calibration capability (i.e., parallax problem)
855	...On-screen roadmap or index		
856	..Cursor		
857	...Pointer direction adjustment	179	.Stylus
858	...Automatic position adjustment	180	.Light pen for CRT display
859	...Status indicator	181	..CRT having tracking capability
860	...Selection emphasis	182	.Light pen for fluid matrix display panel
861	...Dynamically changed appearance (e.g., animated or live action)	183	.Light pen for controlling plural light-emitting display elements (e.g., LED, lamps)
862	...Proximity detection		
863	.Gesture-based	184	.Mechanical control (e.g., rotatable knob, slider)
864	.For a small display screen (e.g., personal digital assistant, palm-top)	501	COMPUTER GRAPHIC PROCESSING SYSTEM
865	.Miscellaneous interface for the handicapped or disabled user	502	.Plural graphics processors
866	.Miscellaneous customization or adaptation	503	..Coprocessor (e.g., graphic accelerator)
867	SCREEN SAVER DISPLAY	504	..Master-slave processors
156	DISPLAY PERIPHERAL INTERFACE INPUT DEVICE	505	..Parallel processors (e.g., identical processors)
157	.Cursor mark position control device	506	..Pipeline processors
158	..Including orientation sensors (e.g., infrared, ultrasonic, remotely controlled)	519	.Integrated circuit (e.g., single chip semiconductor device)
159	..Having variable cursor speed	520	.Interface (e.g., controller)
160	..Cursor key	522	.Graphic command processing
161	..Joystick	530	COMPUTER GRAPHICS DISPLAY MEMORY SYSTEM
162	..Positional storage means	531	.Graphic display memory controller
163	..Mouse	532	..Plural memory controllers
164	...Rotatable ball detector	533	..Using different access modes
165	...Photosensor encoder	534	..Memory access timing signals
166	...Optical detector	535	..Memory arbitration
167	..Trackball	536	.Plural storage devices
168	.Including keyboard	537	..Data transfer between memories
169	..Portable (i.e., handheld, calculator, remote controller)	538	...Data transfer between system memory display memory
170	..Light source associated with each key	539	..Double buffered
171	..Having foreign language capability (e.g., Japanese, Chinese)	540	..Interleaved
172	..Having programmable function key	541	.Shared memory
173	.Touch panel	542	..Unified memory architecture (e.g., UMA)
174	..Including impedance detection	543	.Memory allocation
175	..Including optical detection	544	.Memory partitioning
176	..Transparent substrate having light entrapment capability (i.e., waveguides)	545	.Frame buffer
		546	..Multi-format frame buffer
		547	..Memory for storing video data
		548	..Off-screen memory
		549	..Color memory
		550	...Multiple planes
		551	..Character memory

552	.Texture memory	699	..Controller automatically senses monitor resolution
553	.Display list memory		
554	.Multi-port memory	208	.Waveform generator coupled to display elements
555	.For storing compressed data	209	..Field period polarity reversal
556	.For storing condition code, flag or status	210	..Having three or more voltage levels
557	.Cache	211	.Display power source
558	.First in first out (i.e., FIFO)	212	..Regulating means
559	.Register	213	..Synchronizing means
560	.Row buffer (e.g., line memory)	214	.Controlling the condition of display elements
561	.Logical operations		
562	..Bit block transfer	215	..Including priming means
563	..Mask data operation	1.1	PLURAL DISPLAY SYSTEMS
564	.Addressing	1.2	.Data transmitted or received at surface of display
565	..Using memory for storing address information	1.3	.Tiling or modular adjacent displays
566	..Address manipulation		
567	...Using decoding	2.1	.Remotely located
568	...Address translation (e.g., between virtual and physical addresses)	2.2	..Presentation of similar images
		2.3	..Wireless connection
569	..For 2D coordinate to linear address conversion	3.1	.Diverse systems (e.g., CRT or LCD interface)
570	..Page mode	3.2	..Frame, field or scan rate conversion
571	..Memory addresses arranged in matrix row and column addresses)	3.3	..Number of pixels per row or column conversion (i.e., resolution conversion)
572	..Address generator	3.4	...Controller automatically senses monitor resolution
573	...Plural address generators	4	SINGLE DISPLAY SYSTEM HAVING STACKED SUPERIMPOSED DISPLAY DEVICES (E.G., TANDEM)
574	...Read/Write address generator	5	.Diverse display devices
204	DISPLAY DRIVING CONTROL CIRCUITRY	6	.Three-dimensional arrays
205	.Physically integral with display elements	7	IMAGE SUPERPOSITION BY OPTICAL MEANS (E.G., HEADS-UP DISPLAY)
206	..Having common base or substrate	8	.Operator body-mounted heads-up display (e.g., helmet mounted display)
207	.Light detection means (e.g., with photodetector)	9	.Plural image superposition
690	.Intensity or color driving control (e.g., gray scale)	10	DATA RESPONSIVE CRT DISPLAY CONTROL
691	..Temporal processing (e.g., pulse width variation over time)	11	.CRT provides display control
692	...Binary weighted	12	.Data responsive deflection and intensity control
693	...Non-binary weighted	13	.Data responsive deflection control
694	..Spatial processing (e.g., patterns or subpixel configuration)	14	..X and Y axis deflection control
695	...Subpixels have different shapes	15	..Curvilinear deflection control (e.g., lissajous)
696	...Changing of subpixel location over time	16	..Stroke or vector
697	..Including optical means	17	...Strokes for forming characters
698	.Adjusting display pixel size or pixels per given area (i.e., resolution)	18	...Up/down counter
		19	..Impedance Array

20	.Data responsive intensity control	56	..Image shifting means (i.e., traveling message)
21	..Magnetic element array	57	...Having endless belt or tape reader
22	.Color display	58	..Crosstalk elimination
23	.Graphic and alphanumeric display	59	..Matrix for conveying alphanumeric data
24	.Graphic display	60	..Fluid light emitter (e.g., gas, liquid, or plasma)
25	.Alphanumeric display	61	...Shifting means
26	..Character generator	62	....Specified plasma coupling path
27	.Combined with storage means	63	...Intensity control
28	..Addressing	64	...Liquid light emitter
29	.Delay line	65	...Phosphor excited by fluid response
30	PLURAL PHYSICAL DISPLAY ELEMENT CONTROL SYSTEM (E.G., NON-CRT)	66	...Particular discharge path
31	.Physically movable array	67	...More than two electrodes per element
32	.Optical means interposed in viewing path (e.g., filters, lens, etc.)	68	...Means for combining selective and sustain signals
33	.Segmented display elements	69	....Resistor-diode arrangement
34	..Seven segment display	70	....Including transformer
35	..Bar graph	71	...Electrode insulated from fluid medium
36	...Electroluminescent display elements	72	...Color
37	...Gas discharge display segments (e.g., plasma)	73	..Incandescent
38	...Liquid crystal display segments	74.1	..Cathodoluminescent type
39	...Light-emitting diode segments (LEDS)	75.1	...Vacuum fluorescent
40	...Plural (e.g., stacked, adjacent)	75.2	...Field emissive (e.g., FED, Spindt, microtip, etc.)
41	..Fluid light-emitting display elements (e.g., gas, plasma)	76	..Electroluminescent
42	...Controlling circuitry	77	...Brightness or intensity control
43	..Mask or electrode shape	78	...Having compensating pulse
44	..Solid light-emitting display elements	79	...Field period polarity reversal
45	...Electroluminescent	80	...Driving means integral to substrate
46	...Light-emitting diodes	81	...Optical addressing (e.g., photodetection)
47	..Fluorescent elements	82	..Solid body light emitter (e.g., LED)
48	..Light-controlling display elements	83	...Color
49	...Electrochromic elements	84	..Light-controlling display elements
50	...Liquid crystal elements	85	...Electroscopic (e.g., movable electrodes or electrostatic elements)
51	....Display element selection circuitry	86	...Magneto-optic
52	....Power supply generating circuitry	87	...Liquid crystal display elements (LCD)
53	....Specific waveform (e.g., square waveforms, sinusoidal)	88	....Color
54	....Field period polarity reversal	89	...Gray scale capability (e.g., halftone)
55	.Display elements arranged in matrix (e.g., rows and columns)		

CLASS 345 COMPUTER GRAPHICS PROCESSING, OPERATOR INTERFACE PROCESSING, AND SELECTIVE VISUAL DISPLAY SYSTEMS

90	....Control means at each display element	949	ANIMATION PROCESSING METHOD
91	.....Diode or varistor	950	.Sprite processing
92	.....Thin film transistor (TFT)	951	..Key frame processing
93	.....Redundancy (e.g., plural control elements or electrodes)	952	.Simulation
94	....Waveform generation	953	.Geometric processing
95	.....Three or more voltages	954	..Quaternions
96	.....Field period polarity reversal	955	.Morphing
97	....Ferroelectric liquid crystal elements	956	.Language driven animation
98	...Specific display element control means (e.g., latches, memories, logic)	957	..Actor
99	.....Particular timing circuit	958	.Collision avoidance
100	.....Particular row or column control (e.g., shift register)	959	.Object path adherence
101	...Data signal compensation in response to temperature	960	.Iterative display of preconfigured images
102	...Backlight control	961	OPERATOR INTERFACE WITH VISUAL STRUCTURE OR FUNCTION DICTATED BY INTENDED USE
103	...Grouped electrodes (e.g., matrix partitioned into sections)	962	.Operator interface for marketing or sales
104	...Input/output liquid crystal display panel	963	.Calendar or scheduling
105	...Electrochromic elements	964	.CAD or CAM (e.g., interactive design tools)
106	...Thermochromic elements	965	.For process control and configuration
107	...Particle suspensions (e.g., electrophoretic)	966	..Computer process (e.g., operation of computer)
108	..Plural mechanically movable display elements	967	...Visual or iconic programming
109	...Having shutters	968	...Interface for database querying and retrieval
110	...With motor or rotor driver means	969	..Network layout and operation interface
111	...With a permanent magnet placed on movable display elements	970	..Instrumentation and component modelling (e.g., interactive control panel)
<u>CROSS-REFERENCE ART COLLECTIONS</u>		970.1	.Amusement or marital aid interface
901	ELECTRONIC BOOK WITH DISPLAY	971	COOPERATIVE DECISION SUPPORT SYSTEMS FOR GROUPS OF USERS
902	MENU DISPLAY	972	INSERTED REAL-TIME VIDEO IN OPERATOR INTERFACE
903	MODULAR DISPLAY	973	SCROLL TOOL (E.G., WINDOW SCROLL BARS)
904	DISPLAY WITH FAIL/SAFE TESTING FEATURE	974	SLIDER CONTROLS AS ON-SCREEN OBJECTS IN OPERATOR INTERFACE
905	DISPLAY DEVICE WITH HOUSING STRUCTURE	975	POP-UP DIALOG BOX FOR ENTRY
947	FONT CHARACTER EDGE PROCESSING	976	3-D ICONS
948	ALTERATION OF STORED FONTS TO MAINTAIN FEATURE CONSISTENCY THROUGHOUT SCALED FONT	977	DYNAMIC ICON (E.G., ANIMATED OR LIVE ACTION)
		978	AUDIO INTERACTION AS PART OF AN OPERATOR INTERFACE
		<u>FOREIGN ART COLLECTIONS</u>	

FOR 000 CLASS-RELATED FOREIGN DOCUMENTS

Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collection listed below. These collections contain ONLY foreign patents or nonpatent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

PLURAL PHYSICAL DISPLAY ELEMENT CONTROL SYSTEM (E.G., NON-CRT) (345/30)

- .Display elements arranged in matrix (e.g., rows and columns) (345/55)
- FOR 100 ..Cathodoluminescent type (345/74)
- FOR 101 ...Vacuum fluorescent (345/75)
- FOR 102 ..Memory (345/521)
- FOR 103 .Data manipulation (e.g., masking, interpolation) (345/523)
- FOR 104 ..Logical operation (345/524)
- FOR 105 ..Bit block transfer (345/525)
- FOR 106 .Data transfer between graphic system components (345/526)
- FOR 107 **DISPLAY STORAGE DEVICE (345/507)**
- FOR 108 .Color memory (345/186)
- FOR 109 ..Multiple planes (345/510)
- FOR 110 ...Addressing with priority (345/188)
- FOR 111 .Bit map or graphic memory (345/509)
- FOR 112 ..Addressing (345/515)
- FOR 113 ..Mask data operation (345/191)
- FOR 114 .Character memory (345/192)
- FOR 115 ..Addressing (345/193)
- FOR 116 ..Character generator (345/194)
- FOR 117 ...Multiple fonts (345/195)
- FOR 118 .Row buffer (e.g., line memory) (345/196)
- FOR 119 .Register (345/513)
- FOR 120 ..Shift register (345/197)
- FOR 121 ...With routing logic (345/198)
- FOR 122 .Color look-up-table (e.g., palette) (345/199)
- FOR 123 .Addressing circuitry (345/516)
- FOR 124 ..Memory addresses arranged in matrix (e.g., row and column addresses) (345/517)

- FOR 125 .Plural storage devices (345/508)
- FOR 126 ..Data transfer between memories (345/511)
- FOR 127 .Shared memory (345/512)
- FOR 128 .Condition code, flag, or status (345/514)
- FOR 129 .Multiple port access (345/518)
- FOR 130 .Data compression or compaction (345/202)
- FOR 131 .Significant data assignment in storage device (345/203)
- FOR 132 **PLURAL DISPLAY SYSTEMS (345/1)**
- FOR 133 .Remotely located (345/2)
- FOR 134 .Diverse systems (e.g., CRT/LCD interface) (345/3)
- FOR 135 **DISPLAY ATTRIBUTE CONTROLLER (345/112)**
- FOR 136 .Particular overlay (e.g., superimposing feature) (345/113)
- FOR 137 ..Foreground and background (345/114)
- FOR 138 .Simultaneous diverse images (345/115)
- FOR 139 ..Character and graphical display (345/116)
- FOR 140 .Specified image of abnormal condition (345/117)
- FOR 141 .Having image confined to designated region (e.g., image clipping) (345/118)
- FOR 142 .Image movement or position control (e.g., panning) (345/121)
- FOR 143 ..Scrolling (345/123)
- FOR 144 ...Alphanumeric (345/124)
- FOR 145 ...Graphical (345/125)
- FOR 146 ..Rotation (345/126)
- FOR 147 .Image size control (345/127)
- FOR 148 ..Alphanumeric (345/128)
- FOR 149 ...Reduction (345/129)
- FOR 150 ...Enlargement (345/130)
- FOR 151 ..Graphical (345/131)
- FOR 152 .Defined resolution (e.g., EGA, VGA) (345/132)
- FOR 153 .Graphic display (345/133)
- FOR 154 ..Waveform display (e.g., oscilloscope type) (345/134)
- FOR 155 ..Vector display (345/135)
- FOR 156 ..With image smoothing control (e.g., anti-aliasing) (345/136)
- FOR 157 ...Convolution technique (345/137)
- FOR 158 ..Averaging technique (345/138)
- FOR 159 ..Perspective (345/139)

- FOR 160 ..Bar graph (345/140)
 FOR 161 ..Character display (345/141)
 FOR 162 ..Calligraphic (345/142)
 COMPUTER GRAPHICS PROCESSING
 (345/418)
 ..Character generating (345/467)
 FOR 163 ..Character border (345/144)
 FOR 164 **CURSOR MANIPULATION** (345/145)
 FOR 165 ..Menu selection (345/146)
 DISPLAY ATTRIBUTE CONTROLLER
 (345/112)
 FOR 166 ..Intensity control (e.g., gray scale) (345/147)
 FOR 167 ..Temporal processing (e.g., pulse width variation over time) (345/148)
 FOR 168 ..Spatial processing (e.g., patterns or subpixel configurations) (345/149)
 FOR 169 ..Selectable color attributes (345/150)
 FOR 170 ..Including optical means (345/151)
 FOR 171 ..Designated subpixel arrangement (345/152)
 FOR 172 ..Color bit data modification or conversion (345/153)
 FOR 173 ...Format change (e.g., NTSC to RGB, RGB to composite, or XYZ to RGB) (345/154)
 FOR 174 ...Change in number of bits for a designated color (e.g., 4 bits to 8 bits, 8 bits to 4 bits) (345/155)
 COMPUTER GRAPHICS PROCESSING
 (345/418)
 FOR 175 ..Synchronization of diverse media (345/302)
 FOR 176 **OPERATOR INTERFACE** (345/326)
 FOR 177 ..Interaction in a television environment (345/327)
 FOR 178 ..For video segment editing or sequencing (345/328)
 FOR 179 ..For plural users or sites (345/329)
 FOR 180 ..Computer conferencing (345/330)
 FOR 181 ..Computer supported cooperative work (345/331)
 FOR 182 ...Group window (345/332)
 FOR 183 ..Interface customization or edition (345/333)
 FOR 184 ..Graphical appearance (345/334)
 FOR 185 ..Link between object and task or function (e.g., client/server) (345/335)
 FOR 186 ..Having on-line help (345/336)
 FOR 187 ..Adaptive to user skill level (345/337)
 FOR 188 ..Context sensitive (345/338)
 FOR 189 ..On-screen workspace or object (345/339)
 FOR 190 ..Window (345/340)
 FOR 191 ...Window scrolled to needed portion (345/341)
 FOR 192 ...Layout modification (e.g., move or resize) (345/342)
 FOR 193 ...Window differentiation (345/343)
 FOR 194Priority (345/344)
 FOR 195Viewing lower priority window (345/345)
 FOR 196 ...Interwindow link or communication (345/346)
 FOR 197 ..Pop-up control (e.g., message or dialog box) (345/347)
 FOR 198 ..Icon (345/348)
 FOR 199 ...Metaphoric icon object (345/349)
 FOR 200Indexed book or notebook (345/350)
 FOR 201Office layout (e.g., filing cabinet, desk) (345/351)
 FOR 202 ..Menu (345/352)
 FOR 203 ...Sub-menu structure (345/353)
 FOR 204 ...Using button array (345/354)
 FOR 205 ..Interface represented by 3D space (345/355)
 FOR 206 ..Hierarchy or network structure (345/356)
 FOR 207 ...Navigation within structure (345/357)
 FOR 208 ..Gestured-based (345/358)
 COMPUTER GRAPHICS PROCESSING
 (345/418)
 ..Three-dimension (345/419)
 FOR 209 ..Mapping image onto surface of 3D object (345/425)
 FOR 210 ..Surface detail/characteristic (345/429)
 FOR 211 ..Texture (345/430)
 FOR 212 ..Color (345/431)
 FOR 213 ..Intensity (345/432)
 FOR 214 ..Object processing (345/433)
 FOR 215 ..Clipping (345/434)
 FOR 216 ..Merge/overlay (345/435)
 FOR 217 ..Affine (345/436)
 FOR 218 ..Rotation (345/437)
 FOR 219 ..Translation (345/438)
 FOR 220 ..Sealing (345/439)

WEST☐ Generate Collection☐ Print

L1: Entry 1 of 2

File: USPT

Apr 4, 2000

US-PAT-NO: 6047390

DOCUMENT-IDENTIFIER: US 6047390 A

TITLE: Multiple context software analysis

DATE-ISSUED: April 4, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Butt; Farooq	Austin	TX		
Smith; Roger	Austin	TX		
Stewart; Katherine E.	Austin	TX		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Motorola, Inc.	Schaumburg	IL			02

APPL-NO: 08/ 995359 [PALM]

DATE FILED: December 22, 1997

PARENT-CASE:

This is based on U.S. patent application Ser. No. 08/703,261 filed Aug. 26, 1996, which is hereby incorporated by reference, and priority thereto for common subject matter is hereby claimed.

INT-CL: [07] G06 F 11/00

US-CL-ISSUED: 714/43; 395/675

US-CL-CURRENT: 714/43; 709/105

FIELD-OF-SEARCH: 714/43, 714/26, 714/38, 714/39, 714/41, 714/45, 714/47, 714/11, 714/12, 714/31, 714/37, 395/675, 395/677, 395/568, 395/569, 395/678, 395/680, 364/246, 364/550, 364/568

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

☐ Search Selected☐ Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<u>4462077</u>	July 1984	York	364/300
<input type="checkbox"/>	<u>5129077</u>	July 1992	Hillis	395/500
<input type="checkbox"/>	<u>5179702</u>	January 1993	Spix et al.	395/650
<input type="checkbox"/>	<u>5212794</u>	May 1993	Pettis et al.	395/700
<input type="checkbox"/>	<u>5333304</u>	July 1994	Christensen et al.	395/575
<input type="checkbox"/>	<u>5390336</u>	February 1995	Hillis	395/800
<input type="checkbox"/>	<u>5442758</u>	August 1995	Slingwine	395/375
<input type="checkbox"/>	<u>5485574</u>	January 1996	Bolosky et al.	395/183.11
<input type="checkbox"/>	<u>5490249</u>	February 1996	Miller	395/183.14
<input type="checkbox"/>	<u>5506955</u>	April 1996	Chen et al.	395/183.02
<input type="checkbox"/>	<u>5519867</u>	May 1996	Moeller et al.	395/700
<input type="checkbox"/>	<u>5553235</u>	September 1996	Chen et al.	395/182.18
<input type="checkbox"/>	<u>5560011</u>	September 1996	Uyama	395/700
<input type="checkbox"/>	<u>5590056</u>	December 1996	Barritz	364/550
<input type="checkbox"/>	<u>5594904</u>	January 1997	Linnermark et al.	395/704
<input type="checkbox"/>	<u>5602729</u>	February 1997	Krueger et al.	395/704
<input type="checkbox"/>	<u>5615333</u>	March 1997	Juettner et al.	395/183.14
<input type="checkbox"/>	<u>5682328</u>	October 1997	Roeber et al.	364/550
<input type="checkbox"/>	<u>5684945</u>	November 1997	Chen et al.	395/182.18
<input type="checkbox"/>	<u>5704053</u>	December 1997	Santhannam	284/383
<input type="checkbox"/>	<u>5748878</u>	May 1998	Rees et al.	395/183.14
<input type="checkbox"/>	<u>5799143</u>	August 1998	Butt et al.	395/183.14
<input type="checkbox"/>	<u>5847972</u>	December 1998	Eick et al.	364/514A

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Chilimbi, et al., "StormWatch: A Tool for Visualizing Memory System Protocols", AT&T Bell Laboratories, Sections 1-6, 16 pgs.
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Eggers, et al., "Techniques for Efficient Inline Tracing on a Shared-Memory Multiprocessor", Proceedings of the 1990 ACM Sigmetrics Conference, pp. 37-47 (1990).
Kimelman, et al., "Strata-Various: Multi-Layer Visualization of Dynamics in Software System Behavior", Visualization '94 Conference, IBM Thomas J. Watson Research Center, pp. 1-14 (1994).
Stephens, et al., "Instruction Level Profiling and Evaluation of the IBM RS/6000", ACM (1991).

ART-UNIT: 275

PRIMARY-EXAMINER: Beausoliel, Jr.; Robert W.

ASSISTANT-EXAMINER: Iqbal; Nadeem

ATTY-AGENT-FIRM: Hill; Daniel D.

ABSTRACT:

A method for multiple context analysis of software applications in a multiprocessing (22, 23), multithreaded computer environment utilizes instrumentation code inserted (54, 55) into the applications. For each execution (67) of the application (60), a context set is selected (62). Execution of the instrumented code (67) provides information for analysis in an instrumentation buffer (82) addressed by a reserved register (80) or buffer pointer. The operating system is responsible for providing in the reserved register (80) the address of the instrumentation buffer (82) appropriate for each instrumented context executed. When the application (60) is done with an instrumentation buffer (82), the buffer may be processed by filter software (68). The combination of using a reserved register (80) and allowing the operating system to keep track of relevant context switches allows applications to be instrumented (54, 55) for various context sets without the necessity of modifying (53) or recompiling (52) the application software (60).

2 Claims, 11 Drawing figures

WEST**End of Result Set**

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L1: Entry 2 of 2

File: USPT

Aug 25, 1998

US-PAT-NO: 5799143

DOCUMENT-IDENTIFIER: US 5799143 A

TITLE: Multiple context software analysis

DATE-ISSUED: August 25, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Butt; Farooq	Austin	TX		
Smith; Roger	Austin	TX		
Stewart; Katherine E.	Austin	TX		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Motorola, Inc.	Schaumurg	IL			02

APPL-NO: 08/ 703261 [PALM]

DATE FILED: August 26, 1996

INT-CL: [06] G06 F 11/00

US-CL-ISSUED: 395/183.14; 395/678, 395/568

US-CL-CURRENT: 714/38; 709/108, 712/227FIELD-OF-SEARCH: 395/183.14, 395/183.21, 395/183.13, 395/183.01, 395/184.01,
395/183.09, 395/675, 395/677, 395/678, 395/680, 395/568, 395/569, 395/500, 395/704

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected

Search ALL

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<input type="checkbox"/>	<u>4462077</u>	July 1984	York	395/183.21
<input type="checkbox"/>	<u>5129077</u>	July 1992	Hillis	395/500
<input type="checkbox"/>	<u>5179702</u>	January 1993	Spix et al.	395/650
<input type="checkbox"/>	<u>5212794</u>	May 1993	Pettis et al.	395/183.14
<input type="checkbox"/>	<u>5333304</u>	July 1994	Christensen et al.	395/183.01
<input type="checkbox"/>	<u>5390336</u>	February 1995	Hillis	395/800
<input type="checkbox"/>	<u>5442758</u>	August 1995	Slingwine et al.	395/474
<input type="checkbox"/>	<u>5485574</u>	January 1996	Bolosky et al.	395/184.01
<input type="checkbox"/>	<u>5490249</u>	February 1996	Miller	395/183.14
<input type="checkbox"/>	<u>5519857</u>	May 1996	Moeller et al.	395/181
<input type="checkbox"/>	<u>5553235</u>	September 1996	Chen et al.	395/182.18
<input type="checkbox"/>	<u>5590056</u>	December 1996	Barritz	395/183.14
<input type="checkbox"/>	<u>5594904</u>	January 1997	Linnermark et al.	395/183.11
<input type="checkbox"/>	<u>5602729</u>	February 1997	Krueger et al.	395/184.01

OTHER PUBLICATIONS

"Man Page Interface for IRIX 5.2", pub. by Silicon Graphics, Release 5.2, 5 pgs.
William A. Wulf, "SC'95 Table of Contents by Session", pub. by Assoc. for Computing Machinery, Inc., for Supercomputing Conf. Dec. 3-5, 1995, 9 pgs.
Michael D. Smith, "Tracing with pixie", Version 1.1, pp. 1-29.
Chilimbi, et al, "StormWatch: A Tool for Visualizing Memory System Protocols", pub. by AT&T Bell Labs, for SC'95 TOCS, pp. 1-16.
Kimelman, et al, "Strata-Various:--Multi-Layer Visualization of Dynamics in Software System Behavior", pub. by IBM Thomas J. Watson Res. Center Jul. 26, 1994, for Visualization '94, pp. 1-14.
Chriss Stephens, et al., "Instruction Level Profiling and Evaluation of the IBM RS/6000", pub. by ACM 1991, pp. 180-189.
Susan J. Eggers et al, "Techniques for Efficient Inline Tracing on a Shared-Memory Multiprocessor", pub. by ACM, 1990, pp. 27-37.
Michelle Harr, "Program Visualizer (PV) Tutorial and Reference Manual Release 0.8.1", pub. by IBM Software Solutions, pp. 1-142.

ART-UNIT: 275

PRIMARY-EXAMINER: Palys; Joseph

ATTY-AGENT-FIRM: Hayden; Bruce E. Hill; Daniel D.

ABSTRACT:

A method for multiple context analysis of software applications in a multiprocessing (22, 23), multithreaded computer environment utilizes instrumentation code inserted (54, 55) into the applications. For each execution (67) of the application (60), a context set is selected (62). Execution of the instrumented code (67) provides information for analysis in an instrumentation buffer (82) addressed by a reserved register (80) or buffer pointer. The operating system is responsible for providing in the reserved register (80) the address of the instrumentation buffer (82) appropriate for each instrumented context executed. When the application (60) is done with an instrumentation buffer (82), the buffer may be processed by filter software (68). The combination of using a reserved register (80) and allowing the operating system to keep track of relevant context switches allows applications to be instrumented (54, 55) for various context sets without the necessity of modifying (53) or recompiling (52) the application software (60).

22 Claims, 11 Drawing figures

1	VIRTUAL MACHINE TASK OR PROCESS MANAGEMENT	230	.Computer-to-computer protocol implementing
100	TASK MANAGEMENT OR CONTROL	231	..Computer-to-computer data streaming
101	.Batch or transaction processing	232	..Computer-to-computer data transfer regulating
102	.Process scheduling	233	...Transfer speed regulating
103	..Priority scheduling	234	...Data flow compensating
104	..Resource allocation	235	...Congestion avoiding
105	..Load balancing	236	..Computer-to-computer data framing
106	..Dependency based cooperative processing of multiple programs working together to accomplish a larger task	237	..Computer-to-computer handshaking
107	..Multitasking, time sharing	238	.Computer-to-computer data routing
108	...Context switching	239	..Alternate path routing
200	MULTICOMPUTER DATA TRANSFERRING	240	..Prioritized data routing
201	.Distributed data processing	241	..Least weight routing
202	..Processing agent	242	..Routing data updating
203	..Client/server	243	..Decentralized controlling
204	.Computer conferencing	244	..Centralized controlling
205	..Cooperative computer processing	245	.Computer-to-computer data addressing
206	..Demand based messaging	246	.Computer-to-computer data modifying
207	..Priority based messaging	247	..Compressing/decompressing
208	.Master/slave computer controlling	248	.Multicomputer synchronizing
209	..Master/slave mode selecting	249	.Multiple network interconnecting
210	..Slave computer locking	250	.Network-to-computer interfacing
211	..Master accessing slave storage	251	.Ring computer networking
212	.Computer-to-computer direct memory accessing	252	.Star or tree computer networking
213	.Multicomputer data transferring via shared memory	253	.Bused computer networking
214	..Plural shared memories	310	INTERPROGRAM COMMUNICATION, INTERPROCESS COMMUNICATION (IPC)
215	..Partitioned shared memory	311	.Common Gateway Interface Program Communication
216	..Accessing another computer's memory	312	.Interprogram Communication Using Shared Memory
217	.Remote data accessing	313	.Interprogram Communication Using Message
218	..Using interconnected networks	314	..Message Using Queue
219	..Accessing a remote server	315	..Object Oriented Message
220	.Network computer configuring	316	...Managed Object System
221	..Reconfiguring	317	..Agent
222	..Initializing	318	.Event Handling or Event Notification
223	.Computer network managing	319	.Data Transfer Between Operating Systems
224	..Computer network monitoring	320	.High Level Application Control
225	..Computer network access regulating	321	.Device Driver Communication
226	..Network resource allocating	322	..Multimedia Device Driver
227	.Computer-to-computer session/connection establishing	323	..Video Graphics Device Driver
228	..Session/connection parameter setting		
229	..Network resources access controlling		

**CLASS 709 ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS:
MULTIPLE COMPUTER OR PROCESS COORDINATING**

324	..Virtual Device Driver (VxD)	FOR 111	..Master/slave computer controlling (364/200.38)
325	..RAID Metadriver	FOR 112	..Master/slave mode selecting (395/200.39)
326	..SCSI Device Driver	FOR 113	..Slave computer locking (395/200.4)
327	..Device Driver Configuration	FOR 114	..Master accessing slave storage (395/200.41)
328	..Application program interface (API)	FOR 115	..Computer-to-computer direct memory accessing (395/200.42)
329	..Data Transfer Between Application Windows	FOR 116	..Multicomputer data transferring via shared memory (395/200.43)
330	..Remote procedure call (RPC)	FOR 117	..Plural shared memories (395/200.44)
331	..Dynamic linking, late binding	FOR 118	..Partitioned shared memory (395/200.45)
332	..Object Oriented Dynamic Linking, Late Binding	FOR 119	..Accessing another computer's memory (395/200.46)
400	SYNCHRONIZATION OF PLURAL PROCESSORS	FOR 120	..Remote data accessing (395/200.47)

FOREIGN ART COLLECTIONS

FOR 000 CLASS-RELATED FOREIGN DOCUMENTS

Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collection listed below. These collections contain ONLY foreign patents or nonpatent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

FOR 100	..Communication engineering (364/ FOR 514)	FOR 121	..Using interconnected networks (395/200.48)
FOR 101	..Object detection or tracking (364/FOR 516)	FOR 122	..Accessing a remote server (395/200.49)
FOR 102	..Signal evaluation (target or noise) (364/FOR 517)	FOR 123	..Network computer configuring (395/200.5)
FOR 103	MULTICOMPUTER DATA TRANSFERRING (364/200.3)	FOR 124	..Reconfiguring (395/200.51)
FOR 104	..Distributed data processing (395/200.31)	FOR 125	..Initializing (395/200.52)
FOR 105	..Processing agent (395/200.32)	FOR 126	..Computer network managing (395/200.53)
FOR 106	..Client/server (395/200.33)	FOR 127	..Computer network monitoring (395/200.54)
FOR 107	..Computer conferencing (395/200.34)	FOR 128	..Computer network access regulating (395/200.55)
FOR 108	..Cooperative computer processing (395/200.35)	FOR 129	..Network resource allocating (395/200.56)
FOR 109	..Demand based messaging (395/200.36)	FOR 130	..Computer-to-computer session/connection establishing (395/200.57)
FOR 110	..Priority based messaging (364/200.37)	FOR 131	..Session/connection parameter setting (395/200.58)
		FOR 132	..Network resources access controlling (395/200.59)
		FOR 133	..Computer-to-computer protocol implementing (395/200.6)
		FOR 134	..Computer-to-computer data streaming (395/200.61)
		FOR 135	..Computer-to-computer data transfer regulating (395/200.62)
		FOR 136	...Transfer speed regulating (395/200.63)
		FOR 137	...Data flow compensating (395/200.64)

- FOR 138 ...Congestion avoiding (395/
200.65)
- FOR 139 ..Computer-to-computer data
framing (395/200.66)
- FOR 140 ..Computer-to-computer handshake
(395/200.67)
- FOR 141 .Computer-to-computer data
routing (395/200.68)
- FOR 142 ..Alternate path routing (395/
200.69)
- FOR 143 ..Prioritized data routing (395/
200.7)
- FOR 144 ..Least weight routing (395/
200.71)
- FOR 145 ..Routing dating updating (395/
200.72)
- FOR 146 ..Decentralized controlling (395/
200.73)
- FOR 147 ..Centralized controlling (395/
200.74)
- FOR 148 .Computer-to-computer data
addressing (395/200.75)
- FOR 149 .Computer-to-computer data
modifying (395/200.76)
- FOR 150 ..Compressing/decompressing (395/
200.77)
- FOR 151 .Multicomputer synchronizing
(395/200.78)
- FOR 152 .Multiple network interconnecting
(395/200.79)
- FOR 153 .Network-to-computer interfacing
(395/200.8)
- FOR 154 .Ring computer networking (395/
200.81)
- FOR 155 .Star or tree computer networking
(395/200.82)
- FOR 156 .Bused computer networking (395/
200.83)
- FOR 157 **VIRTUAL MACHINE TASK AND PROCESS
MANAGEMENT (395/406)**
- FOR 158 **SYNCHRONIZATION OF PLURAL
PROCESSORS (395/553)**
- FOR 159 **TASK MANAGEMENT OR CONTROL (395/
670)**
- FOR 160 .Batch or transaction processing
(395/671)
- FOR 161 .Process scheduling (395/672)
- FOR 162 ..Priority scheduling (395/673)
- FOR 163 ..Resource allocation (395/674)
- FOR 164 ..Load balancing (395/675)
- FOR 165 ..Dependency based cooperative
processing of multiple
programs working together to
accomplish a larger task (395/
676)
- FOR 166 ..Multitasking, time sharing
(395/677)
- FOR 167 ...Context switching (395/678)
- FOR 168 **INTERPROGRAM COMMUNICATION,
INTERPROCESS COMMUNICATION
(395/680)**
- FOR 169 .Device Driver Communication
(395/681)
- FOR 170 .Application program interfacing
(API) (395/682)
- FOR 171 .Object oriented messaging (395/
683)
- FOR 172 .Remote procedure calling (RPC)
(395/684)
- FOR 173 .Dynamic linking, late binding
(395/685)

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CLASS 709 ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS:
MULTIPLE COMPUTER OR PROCESS COORDINATING

April 2003

100	DATA PROCESSING SYSTEM ERROR OR FAULT HANDLING	26	...Artificial intelligence (e.g., diagnostic expert system)
1	..Reliability and availability	27	...Particular access structure
2	..Fault recovery	28	...Substituted emulative component (e.g., emulator microprocessor)
3	...By masking or reconfiguration		
4	....Of network	29	.....Memory emulator feature
5	....Of memory or peripheral subsystem	30	....Built-in hardware for diagnosing or testing within- system component (e.g., microprocessor test mode circuit, scan path)
6	.....Redundant stored data accessed (e.g., duplicated data, error correction coded data, or other parity-type data)	31	....Additional processor for in- system fault locating (e.g., distributed diagnosis program)
7	.....Reconfiguration (e.g., adding a replacement storage component)	32	...Particular stimulus creation
8	.....Isolating failed storage location (e.g., sector remapping)	33	....Derived from analysis (e.g., of a specification or by stimulation)
9	.....Access processor affected (e.g., I/O processor, MMU, DMA processor)	34	....Halt, clock, or interrupt signal (e.g., freezing, hardware breakpoint, single- stepping)
10	....Of processor		
11	.....Concurrent, redundantly operating processors	35	....Substituted or added instruction (e.g., code instrumenting, breakpoint instruction)
12	.....Synchronization maintenance of processors		
13	.....Prepared backup processor (e.g., initializing cold backup) or updating backup processor (e.g., by checkpoint message)	36	...Test sequence at power-up or initialization
14	...Of power supply	37	...Analysis (e.g., of output, state, or design)
15	...State recovery (i.e., process or data file)	38	...Of computer software
16	...Forward recovery (e.g., redoing committed action)	39	...Monitor recognizes sequence of events (e.g., protocol or logic state analyzer)
17	....Reexecuting single instruction or bus cycle	40	...Component dependent technique
18	....Transmission data record (e.g., for retransmission)	41	...For reliability enhancing component (e.g., testing backup spare, or fault injection)
19	....Undo record	42	...Memory or storage device component fault
20	....Plural recovery data sets containing set interrelation data (e.g., time values or log record numbers)	43	...Bus, I/O channel, or network path component fault
21	....State validity check	44	...Peripheral device component fault
22	....With power supply status monitoring	45	...Output recording (e.g., signature or trace)
23	...Resetting processor	46	...Operator interface for diagnosing or testing
24	...Safe shutdown	47	..Performance monitoring for fault avoidance
25	..Fault locating (i.e., diagnosis or testing)	48	..Error detection or notification

49	...State error (i.e., content of instruction, data, or message)	724	.Digital logic testing
50	....State out of sequence	725	..Programmable logic array (PLA) testing
51	....Control flow state sequence monitored (e.g., watchdog processor for control-flow checking)	726	..Scan path testing (e.g., level sensitive scan design (LSSD))
52	....Error checking code	727	...Boundary scan
53	...Address error	728	...Random pattern generation (includes pseudorandom pattern)
54	...Storage content error	729	...Plural scan paths
55	...Timing error (e.g., watchdog timer time-out)	730	...Addressing
56	...Bus or I/O channel device fault	731	...Clock or synchronization
57	...Error forwarding and presentation (e.g., operator console, error display)	732	..Signature analysis
699	PULSE OR DATA ERROR HANDLING	733	..Built-in testing circuit (BILBO)
700	.Skew detection correction	734	..Structural (in-circuit test)
701	.Data formatting to improve error detection correction capability	735	..Device response compared to input pattern
702	..Memory access (e.g., address permutation)	736	..Device response compared to expected fault-free response
703	.Testing of error-check system	737	..Device response compared to fault dictionary/truth table
704	.Error count or rate	738	..Including test pattern generator
705	..Pseudo-error rate	739	...Random pattern generation (includes pseudorandom pattern)
706	..Up-down counter	740	...Having analog signal
707	..Synchronization control	741	...Simulation
708	..Shutdown or establishing system parameter (e.g., transmission rate)	742	...Testing specific device
709	.Data pulse evaluation/bit decision	743	...Addressing
710	.Replacement of memory spare location, portion, or segment	744	...Clock or synchronization
711	..Spare row or column	745	..Determination of marginal operation limits
712	.Transmission facility testing	746	.Digital data error correction
713	..For channel having repeater	747	..Substitution of previous valid data
714	..By tone signal	748	..Request for retransmission
715	..Test pattern with comparison	749	...Retransmission if no ACK returned
716	...Loop-back	750	...Feedback to transmitter for comparison
717	..Loop or ring configuration	751	...Including forward error correction capability
718	.Memory testing	752	..Forward correction by block code
719	..Read-in with read-out and compare	753	...Double error correcting with single error correcting code
720	...Special test pattern (e.g., checkerboard, walking ones)	754	...Error correction during refresh cycle
721	..Electrical parameter (e.g., threshold voltage)	755	...Double encoding codes (e.g., product, concatenated)
722	..Performing arithmetic function on memory contents		
723	..Error mapping or logging		

756	....Cross-interleave Reed-Solomon code (CIRC)	791	...Sequential decoder (e.g., Fano or stack algorithm)
757	...Parallel generation of check bits	792	...Trellis code
758	...Error correcting code with additional error detection code (e.g., cyclic redundancy character, parity)	793	...Syndrome decodable (e.g., self orthogonal)
759	...Look-up table encoding or decoding	794	...Maximum likelihood
760	...Threshold decoding (e.g., majority logic)	795	...Viterbi decoding
761	...Random and burst error correction	796	...Branch metric calculation
762	...Burst error correction	797	..Majority decision/voter circuit
763	...Memory access	798	.Error detection for synchronization control
764	....Error correct and restore	799	.Error/fault detection technique
765	....Error pointer	800	..Parity bit
766	....Check bits stored in separate area of memory	801	...Parity generator or checker circuit detail
767	....Code word for plural n-bit (n>1) storage units (e.g., x4 DRAM's)	802	...Even and odd parity
768	....Error correction code for memory address	803	...Parity prediction
769	....Dynamic data storage	804	...Plural dimension parity check
770	.....Disk array	805	...Storage accessing (e.g., address parity check)
771	.....Tape	806	..Constant-ratio code (m/n)
772	....Code word parallel access	807	..Check character
773	....Solid state memory	808	...Modulo-n residue check character
774	..Adaptive error-correcting capability	809	..Code constraint monitored
775	...Synchronization	810	...Multilevel coding (n>2)
776	...For packet or frame multiplexed data	811	..Forbidden combination or improper condition
777	..Hamming code	812	...Specified digital signal or pulse count
778	...Nonbinary data (e.g., ternary)	813	...Two key-down detector
779	...Variable length data	814	...Data timing/clocking
780	...Using symbol reliability information (e.g., soft decision)	815	...Time delay/interval monitored
781	...Code based on generator polynomial	816	...Two-rail logic
782	....Bose-Chaudhuri-Hocquenghem code	817	...Noise level
783	...Golay code	818	...Missing-bit/drop-out detection
784	....Reed-Solomon code	819	..Comparison of data
785	....Syndrome computed	820	...Plural parallel devices of channels
786	..Forward error correction by tree code (e.g., convolutional)	821	....Transmission facility
787	...Random and burst errors	822	...Sequential repetition
788	...Burst error	823	....True and complement data
789	...Synchronization	824	...Device output compared to input
790	...Puncturing		

FOREIGN ART COLLECTIONS

FOR 000 CLASS-RELATED FOREIGN DOCUMENTS

Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collection listed below. These collections contain ONLY foreign patents or nonpatent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

MEMORY TESTING (371/21.1)**DIGITAL LOGIC TESTING (371/22.1)****DIGITAL DATA ERROR CORRECTION
(371/30)**

FOR 100 .Scan path testing (LSSD) (371/
22.3)

FOR 101 .Including test pattern generator
(371/27)

FOR 102 .Block code (371/37.1)

FOR 103 ..Memory access (371/40.1)

FOR 104 .Convolutional code (371/43)

FOR 288 **ERROR/FAULT ANTICIPATION (371/4)**
.Replacement with spare device or
system (371/8.1)

FOR 289 ..Transmission facility or
channel (371.8.2)

FOR 290 ..Memory (371/10.1)

FOR 291 ..Transmission facility (371/
11.2)

FOR 292 ..Data processor or computer
(371/11.3)

DIAGNOSTIC TESTING (371/15.1)

FOR 293 .Programmable processor testing
(371/16.1)

FOR 294 ..Emulator device (371/16.2)

FOR 295 ..Watchdog timer (e.g., time-out)
(371/16.3)

FOR 296 ..Processor within diverse
(microwave, photocopier) (371/
16.4)

FOR 297 ..Error or fault, logging or
tracking (371/16.5)

FOR 298 ..Dedicated maintenance subsystem
(371/18)

FOR 299 .Testing of external device by
programmable digital computer
(371/20)

FOR 300 **ERROR DETECTION FOR
SYNCHRONIZATION CONTROL (371/
47.1)**